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located on or adjacent to the right front corner post, facing outward toward the right side of the vehicle.

For containers that exceed 40 feet in length, the Tag must be adjacent to the rearward side of the post at the forward 40-foot corner lock position, see FIGURE 9.

The Tag shall be mounted vertically so that it will respond to a vertically polarized signal from the Reader System.

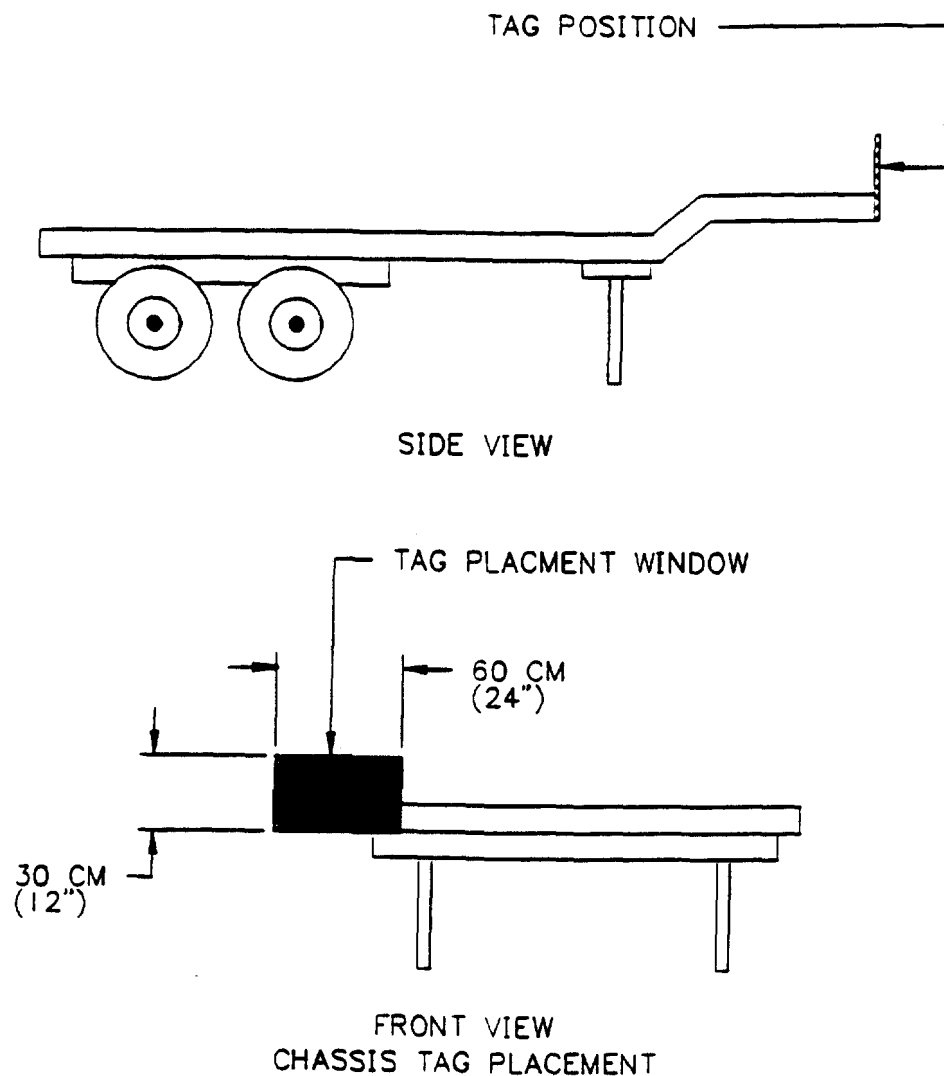
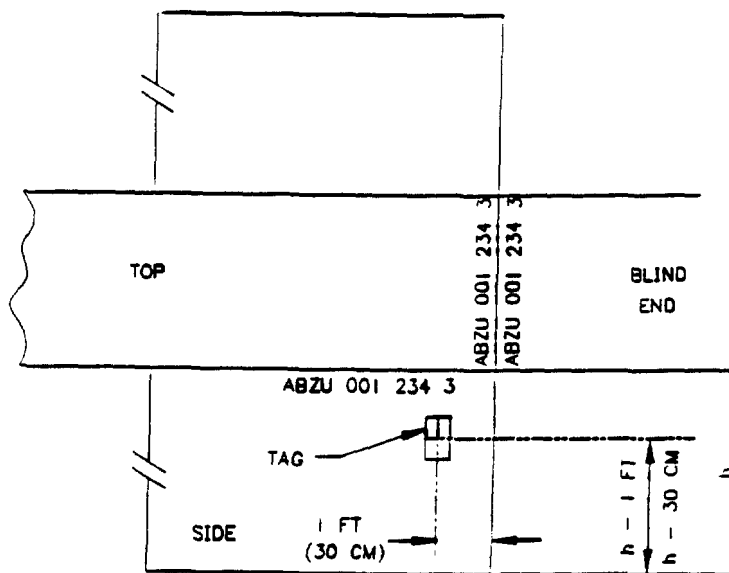


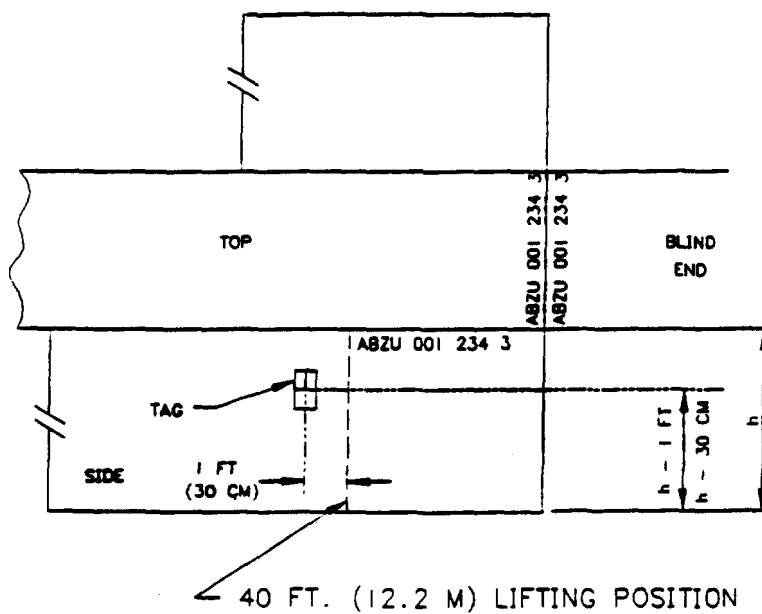
FIGURE 7

1



CONTAINER TAG PLACEMENT FOR CONTAINERS OF 40 FT. (12.2M) OR LESS

FIGURE 8



CONTAINER TAG PLACEMENT FOR CONTAINERS GREATER THAN 40 FT. (12.2M) LENGTH

FIGURE 9

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APPENDIX A

**A Description of the Tag Data
Format for the Tractor**

1. Bits Available for General Use

Fields specified by the Standard are listed in Table A; General Use fields are indicated in bold type. A description of each General Use field is presented in the paragraphs following Table A.

Table A: Data Field Descriptions for the Tractor Tag

Entry	Bits Required	Tag Data Sequence	Minimum Value	Maximum Value	Units	Units
Equipment Group Code	5	0-4	0	31	Type Code	
Tag Type	2	5-6	1	4	Type Code	
SCAC Code	19	7-25	A	ZZZZ	Alpha	
Identification Number	42	26-59,64-71	0	ZZZZZZZZ	Alphanumeric	
First Check Sum	2	60-61				
Reserved Frame Marker	2	62-63				
Number of Axles	3	72-74	0	7		Axles
Tare Weight	8	75-82	0	255	100's of Kg.	
Wheelbase	6	83-88	26	64	Decimeters	
Fifth Wheel Off-Set	4	89-92	0	8	Decimeters	
Tare Weight on Steering Axle	5	93-97	20	50	100's of Kg.	
Drive Axle Spread	5	98-102	0	26	Decimeters	
Reserved	3	103-105			Reserved	
Security	12	106-117	Reserved for Security or limited Owner's use			
Data Format Code	6	118-123				
Second Check Sum		124-125				
Frame Marker	2	126-127				

The fields are arranged in a hierarchical fashion in order to expedite translation and processing by the data processor. It is intended that the data processor will first look at the Data Format Code to determine if the Tag should be decoded or ignored. For example, in some cases the data processor will wish to ignore all Tags except those specified as highway (ATA Standard) or marine intermodal (ISO Standard) Tags.

Once the Data Format Code has been processed, then the data processor will look to the Tag Type to determine the configuration, capabilities, and memory capacity of the Tag. (Note: This field is provided for future use to accommodate new types of Tags which may have different memory or communication capabilities).

Next, the data processor will examine the Equipment Group Code to determine if the tagged equipment is relevant. For example, the processor may ignore, or process differently, non-revenue equipment than it would trailers or dollies.

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The order in which the remaining fields are processed will be dictated by the particular application.

1.1 **Equipment Group Code:** This is a numeric field having a value from 0 to 31 that indicates the general type of equipment. A proposed table of values for this field is indicated below. Note that only major categories of equipment types are indicated in this field and other fields are allotted to indicate further details. The Equipment Group Code for a tractor is decimal 17 (binary 10001).

Table B: Data Values for the Equipment Group Code

<u>Value</u>	<u>Description</u>	<u>Value</u>	<u>Description</u>
0	Other	16	Reserved
1	Reserved	17	Tractor (Power Only)
2	Reserved	18	Truck (Power and Cargo Bed)
3	Reserved	19	Railcar
4	Reserved	20	Dolly
5	Locomotive	21	Trailer
6	End-of-Train Device	22	Reserved
7	Reserved	23	Reserved
8	Reserved	24	Reserved
9	Reserved	25	Reserved
10	Intermodal Container	26	Reserved
11	Reserved	27	Chassis
12	Reserved	28	Reserved
13	Reserved	29	Reserved
14	Non-Revenue	30	Reserved
15	Reserved	31	Reserved

1.2 **Tag Type:** The Tag Type indicates the configuration, capability, and memory size of the Tag. At the present time there is only one Tag Type defined, as indicated in Table C:

Table C: Data Values for the Tag Type

<u>Decimal Value</u>	<u>Description</u>
1	Reserved
2	Tag described by the AAR Standard (Current Version), and the ISO Draft International Standard DIS 10374, and the ATA Proposed Standard
3	Reserved
4	Reserved

To code the Tag Type value into the Tag, the decimal value is reduced by one and converted to its base 2 equivalent.

1.3 SCAC Code: The SCAC (Owner's) Code is equivalent to the Standard Carrier Alpha Code (SCAC) and is composed of four letters that can be represented as C1; C2; C3; C4. To code this information in the Tag, the possible letters represented by C1 will be assigned to the following decimal values: A=0, B=1, C=2, ..., Z=25. The letters C2, C3 and C4 will be assigned the following values: Blank =0, A=1, B=2, ..., Z=26. This code assignment allows for a SCAC Code of less than four characters, with the actual characters left justified, and the remainder of the field padded with blanks.

Conversion from alpha to numeric would involve the following:

1. Determine the numeric equivalent of characters C1 through C4. This will result in four numeric values; N1 through N4.
2. Convert N1 through N4 into one numeric value by using the formula:

$$\text{Value} = (N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27) + N4$$

The base 2 equivalent of the decimal number "Value" is stored in the Tag's SCAC Code field.

Conversion from a base 2 tag format back to the four SCAC letters would involve the following, where "Value" is the decimal equivalent of the base 2 value in the SCAC Code field.

1. $N1 = \text{Value} / 27^3$ (integer - drop fractions)
2. $N2 = (\text{Value} - (N1 \times 27^3)) / 27^2$ (integer)
3. $N3 = (\text{Value} - ((N1 \times 27^3) + (N2 \times 27^2))) / 27$ (integer)
4. $N4 = \text{Value} - ((N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27))$
5. Use the letter-to-number assignments referred to above to convert N1 through N4 from a numeric value to its letter equivalent.

1.4 Identification Number: The Identification Number consists of eight alphanumeric characters. Each character shall be assigned a numeric value as indicated below:

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<u>Identification Character</u>	<u>Numeric Value</u>	<u>Identification Character</u>	<u>Numeric Value</u>
(space)	0	H	18
0	1	I	19
1	2	J	20
2	3	K	21
3	4	L	22
4	5	M	23
5	6	N	24
6	7	O	25
7	8	P	26
8	9	Q	27
9	10	R	28
A	11	S	29
B	12	T	30
C	13	U	31
D	14	V	32
E	15	W	33
F	16	X	34
G	17	Y	35
		Z	36

The value associated with each character position will then form a base 37

1.8 **5th Wheel Off-Set:** The 5th Wheel Off-Set is measured from the center of the kingpin to the mid-point between the rear axles (or the center of the rear axle for single axle configurations), see FIGURE 10. To encode the 5th Wheel Off-Set into the Tag, use the Table below to find the value, then convert the result to its base 2 equivalent. A binary zero ("0") shall be used to indicate that the 5th Wheel Off-Set is unknown or is not utilized.

5th Wheel Offset Code Values

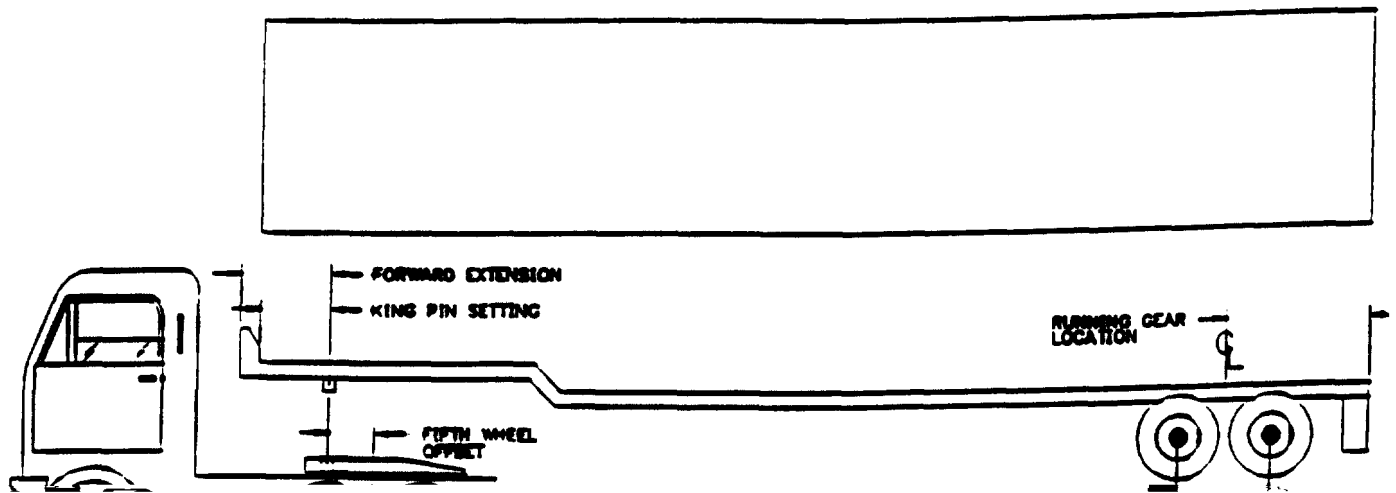
<u>Code</u>	<u>Off-Set Range</u>
0	Unknown
1	> 0 to 1 Decimeter
2	> 1 to 2 Decimeter
3	> 2 to 3 Decimeter
4	> 3 to 4 Decimeter
5	> 4 to 5 Decimeter
6	> 5 to 6 Decimeter
7	> 6 to 7 Decimeter
8	> 7 Decimeter

1.9 **Tare Weight on Steering Axle:** To encode the Tare Weight on the Steering Axle into the Tag, the metric value from 20 to 50 hundred kilograms must first be reduced by 19 hundred kilograms then converted to its base 2 equivalent. A binary zero ("0") shall be used to indicate that the Tare Weight on Steering Axle is unknown or is not utilized.

1.10 **Drive Axle Spread:** The Drive Axle Spread is measured from the center of the first rear axle to the center of the last rear axle, see FIGURE 10. To encode the Drive Axle Spread into the Tag, the decimal value from 0 to 27 decimeters must be converted to its base 2 equivalent. A decimal value of 27 shall be used only to indicate a tractor with a single rear axle.

A binary zero ("0") shall be used to indicate that the Drive Axle Spread is unknown or is not utilized.

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APPENDIX B

**A Description of the Tag Data
Format for the Dolly**

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1. **Bits Available for General Use**

Fields specified by the Standard are listed in Table A; General Use fields are indicated in bold type. A description of each General Use field is presented in the paragraphs following Table A.

Table A: Data Field Descriptions for the Dolly Tag

Entry	Bits Required	Tag Data Sequence	Minimum Value	Maximum Value	Units
Equipment Group Code	5	0-4	0	31	Type Code
Tag Type	2	5-6	1	4	Type Code
Tag ID	16	7-22	1	65535	Alpha

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The order in which the remaining fields are processed will be dictated by the particular application.

1.1 **Equipment Group Code:** This is a numeric field having a value from 0 to 31 that indicates the general type of equipment. A proposed table of values for this field is indicated below. Note that only major categories of equipment types are indicated in this field and other fields are allotted to indicate further details. The Equipment Group Code for a dolly is decimal 20 (binary 10100).

Table B: Data Values for the Equipment Group Code

<u>Value</u>	<u>Description</u>	<u>Value</u>	<u>Description</u>
0	Other	16	Reserved
1	Reserved	17	Tractor (Power Only)
2	Reserved	18	Truck (Power and Cargo Bed)
3	Reserved	19	Railcar
4	Reserved	20	Dolly
5	Locomotive	21	Trailer
6	End-of-Train Device	22	Reserved
7	Reserved	23	Reserved
8	Reserved	24	Reserved
9	Reserved	25	Reserved
10	Intermodal Container	26	Reserved
11	Reserved	27	Chassis
12	Reserved	28	Reserved
13	Reserved	29	Reserved
14	Non-Revenue	30	Reserved
15	Reserved	31	Reserved

1.2 **Tag Type:** The Tag Type indicates the configuration, capability, and memory size of the Tag. At the present time there is only one Tag Type defined, as indicated in Table C.

Table C: Data Values for the Tag Type Field

<u>Decimal Value</u>	<u>Description</u>
1	Reserved
2	Tag described by the AAR Standard (Current Version), the ISO Draft International Standard DIS 10374, and the ATA Proposed Standard
3	Reserved
4	Reserved

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To code the Tag Type value into the Tag, the decimal value is reduced by one and converted to its base 2 equivalent.

1.3 **SCAC Code:** The SCAC (Owner's) Code is composed of four letters and can be represented as C1; C2; C3; C4. To code this information in the Tag, the possible letters represented by C1 will be assigned to the following decimal values: A=0, B=1, C=2, ..., Z=25. The letters C2, C3 and C4 will be assigned the following values: Blank=0, A=1, B=2, ..., Z=26. This code assignment allows for an SCAC Code of less than four characters, with the actual characters left justified, and the remainder of the field padded with blanks.

Conversion from alpha to numeric would involve the following:

1. Determine the numeric equivalent of characters C1 through C4. This will result in four numeric values; N1 through N4.
2. Convert N1 through N4 into one numeric value by using the formula:

$$\text{Value} = (N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27) + N4$$

The base 2 equivalent of the decimal number "Value" is stored in the Tag's SCAC Code field.

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<u>Identification Character</u>	<u>Numeric Value</u>	<u>Identification Character</u>	<u>Numeric Value</u>
(space)	0	H	18
0	1	I	19
1	2	J	20
2	3	K	21
3	4	L	22
4	5	M	23
5	6	N	24
6	7	O	25
7	8	P	26
8	9	Q	27
9	10	R	28
A	11	S	29
B	12	T	30
C	13	U	31
D	14	V	32
E	15	W	33
F	16	X	34
G	17	Y	35
		Z	36

The value associated with each character position will then form a base 37 number which is 8 digits long. The 8-digit number is encoded into the Tag by converting it from base 37 to its base 2 equivalent.

1.5 Number of Axles: This field indicates the number of axles on a dolly. To encode the Number of Axles into the Tag, the decimal value from 1 to 7 is converted to base 2. A "0" (zero) value indicates the Number of Axles is unknown.

1.6 Tare Weight: This field indicates the dolly Tare Weight in hundreds of kilograms. To encode the Tare Weight into the Tag, the decimal value from 0 to 63 must be converted to its equivalent base 2 value. A "0" (zero) value indicates that the Tare Weight is unknown.

1.7 Dolly Type Code: The Dolly Type Code is provided to enable determination of the class or type of dolly. To encode the Dolly Type Code into the Tag, the decimal value from 0 to 127 must be converted to the equivalent base 2 value. A definition of the Dolly type Code values will be developed in the future. The decimal value "0" (zero) represents no type code provided.

APPENDIX C

A Description of the Tag Data Format for the Trailer

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1. Bits Available for General Use

Fields specified by the Standard are listed in Table A; General Use fields are indicated in bold type. A description of each General Use field is presented in the paragraphs following Table A.

Table A: Data Field Descriptions for the Trailer Tag

Entry	Bits Required	Tag Data Sequence	Minimum Value	Maximum Value	Units
Equipment Group Code	5	0-4	0	31	Type Code
Tag Type	2	5-6	1	4	Type Code
SCAC Code	19	7-25	A	ZZZZ	Alpha
Identification Number	42	26-59,64-71	0	ZZZZZZZZ	Alphanumeric
First Check Sum	2	60-61			
Reserved Frame Marker	2	62-63			
Length	11	72-82	0	2047	Centimeters
Width Code	2	83-84	0	3	Width Code
Tandem Width Code	2	85-86	0	3	Width Code
Trailer Type Code	4	87-90	0	15	Type Code
Forward Extension	8	91-98	30	284	Centimeters
Tare Weight	7	99-105	15	141	100's of Kg.
Height/Security	12	106-117		Reserved for Security or Height	
Data Format Code	6	118-123			
Second Check Sum	2	124-125			
Frame Marker	2	126-127			

The fields are arranged in a hierarchical fashion in order to expedite translation and processing by the data processor. It is intended that the data processor will first look at the Data Format Code to determine if the Tag should be decoded or ignored. For example, in some cases the data processor will wish to ignore all Tags except those specified as highway (ATA Standard) or marine intermodal (ISO Standard) Tags.

Once the Data Format Code has been processed, then the data processor will look to the Tag Type to determine the configuration, capabilities, and memory capacity of the Tag. (Note: This field is provided for future use to accommodate new types of Tags which may have different memory or communication capabilities).

The order in which the remaining fields are processed will be dictated by the particular application.

1.1 **Equipment Group Code:** This is a numeric field having a value from 0 to 31 that indicates the general type of equipment. A proposed table of values for this field is indicated below. Note that only major categories of equipment types are indicated in this field and other fields are allotted to indicate further details. The Equipment Group Code for a trailer is a decimal 21 (binary 10101).

Table B: Data Values for the Equipment Group Code

<u>Value</u>	<u>Description</u>	<u>Value</u>	<u>Description</u>
0	Other	16	Reserved
1	Reserved	17	Tractor (Power Only)
2	Reserved	18	Truck (Power and Cargo Bed)
3	Reserved	19	Railcar
4	Reserved	20	Dolly
5	Locomotive	21	Trailer
6	End-of-Train Device	22	Reserved
7	Reserved	23	Reserved
8	Reserved	24	Reserved
9	Reserved	25	Reserved
10	Intermodal Container	26	Reserved
11	Reserved	27	Chassis
12	Reserved	28	Reserved
13	Reserved	29	Reserved
14	Non-Revenue	30	Reserved
15	Reserved	31	Reserved

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1.2 **Tag Type:** The Tag Type indicates the configuration, capability, and memory size of the Tag. At the present time there is only one Tag Type defined, as indicated in Table C.

Table C: Data Values for the Tag Type Field

<u>Decimal Value</u>	<u>Description</u>
1	Reserved
2	Tag described by the AAR Standard (Current Version), the ISO Draft International Standard DIS 10374, and the ATA Proposed Standard
3	Reserved
4	Reserved

To code the Tag Type value into the Tag, the decimal value is reduced

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1. $N1 = \text{Value} / 27^3$ (integer - drop fractions)
2. $N2 = (\text{Value} - (N1 \times 27^3)) / 27^2$ (integer)
3. $N3 = (\text{Value} - ((N1 \times 27^3) + (N2 \times 27^2))) / 27$ (integer)
4. $N4 = \text{Value} - ((N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27))$
5. Use the letter-to-number assignments referred to above to convert N1 through N4 from a numeric value to its letter equivalent.

1.4 Identification Number: The Identification Number consists of eight alphanumeric characters. Each character shall be assigned a numeric value as indicated below:

Identification	Numeric
----------------	---------

Identification	Numeric
----------------	---------

1.5 **Length:** This field indicates the trailer length. The length field is equivalent to the overall (outside) length of the trailer, including forward protrusion but excluding dock bumpers. To encode the **Length** into the Tag, the decimal value from 0 to 2047 centimeters is converted to its equivalent base 2 value. A "0" (zero) indicates a "does not apply" or "unknown" condition.

1.6 **Width Code:** The trailer width is measured from the outside surfaces of the trailer. The Trailer Width Code is encoded according to the following table.

<u>Trailer Width</u>	<u>Code Value</u>
Unknown	0
96" (2.5 meters) or less	1
More than 96" (2.5 meters), but not more than 102" (2.6 meters)	2
More than 102" (2.6 meters)	3

The decimal code value from 0 to 3 associated with the Trailer Width Code is encoded into the Tag by converting the value to its corresponding base 2 number.

1.7 **Tandem Width Code** The Tandem Width indicates the nominal width of the trailer tandem, defined as the extreme width spanned by the outside tires of an axle. (The Tandem Width is usually 2.5 or 2.6 meters, e.g., 96 or 102 inches.) To encode the tandem width into the Tag, use the same procedure and table given for Width, above.

1.8 **Trailer Type Code:** To encode the Trailer Type Code into the Tag, the decimal value from 0 to 15 must be converted to the equivalent base 2 value. Table D presents a description of each Trailer Type Code value. The decimal value 15 represents no type code provided. [Rail compatible trailers are trailers capable of operation on railroads without an underlying flatcar platform.]

Table D: Data Values for the Trailer Type Code

<u>Value</u>	<u>Description</u>
0	Bulk Hopper or Tank
1	Mechanical Refrigerator-Underslung
2	General Service (non-equipped) Dry Van
3	Flat Bed (Including removable sides, platforms and expandables)
4	Open Top
5	Mechanical Refrigerator-Nose Mount
6	Rail Compatible Trailer, without Integral Rail Wheels
7	Insulated

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Table D: Data Values for the Trailer Type Code (Cont'd)

8	Drop Frame (Including Wedge Frames)
9	Special Equipped Straight Floor Closed
10	Rail Compatible Trailer, with Integral Rail Wheels
11-14	Reserved
15	Unknown, Not Used

1.9 Forward Extension: The Forward Extension field indicates the distance from the center of the king-pin to the most forward protrusion on the trailer. To encode the Forward Extension into the Tag, the decimal value from 30 to 284 centimeters must be reduced by decimal 29 then converted to the equivalent base 2 value. A "0" (zero) indicates a "does not apply" condition.

1.10 Tare Weight: This field indicates the trailer Tare Weight in hundreds of kilograms. To encode the Tare Weight into the Tag, the decimal value from 15 to

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<u>T₁ or T₀</u> <u>Value</u>	<u>A₁ or A₀</u> <u>Character</u>	<u>T₁ or T₀</u> <u>Value</u>	<u>A₁ or A₀</u> <u>Character</u>
0	/	19	I
1	0	20	J
2	1	21	K
3	2	22	L
4	3	23	M
5	4	24	N
6	5	25	O
7	6	26	P
8	7	27	Q
9	8	28	R
10	9	29	S
11	A	30	T
12	B	31	U
13	C	32	V
14	D	33	W
15	E	34	X
16	F	35	Y
17	G	36	Z
18	H		

3. Using the Six-Bit ASCII table presented in Appendix G, find the decimal values associated with the A₁ character and then the A₀ character. Finally, these decimal values must then be converted to corresponding base 2 values.

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APPENDIX D

**A Description of the Tag Data
Format for the Chassis**

Subject to revision by the Ocean and Rail industries.

1. Bits Available for General Use

Fields specified by the Standard are listed in Table A; General Use fields are indicated in bold type. A description of each General Use field is presented in the paragraphs following Table A.

Table A: Data Field Descriptions for the Chassis Tag

Entry	Bits Required	Tag Data Sequence	Minimum Value	Maximum Value	Units
Equipment Group Code	5	0-4	0	31	Type Code
Tag Type	2	5-6	1	4	Type Code
Owner's Mark (Initial)	19	7-25	A	ZZZZ	Alpha
Identification Number	20	26-45	0	999999	Numeric
Chassis Type Code	4	46-49	0	15	Types
Tare Weight	6	50-55	15	77	100's of Kg.
First Check Sum	2	60-61			
Reserved Frame Marker	2	62-63			
Height	7	56-59,64-66	40	166	Centimeters
Tandem Width Code	2	67-68	0	3	Code
Forward Extension	6	69-74	30	154	
Kingpin Setting	6	75-80	30	154	Centimeters
Axle Spacing	5	81-85	10	40	Decimeters
Running Gear Location	5	86-90	13	43	Decimeters
Number of Lengths	3	91-93	0	7	Numeric
Minimum Length	10	94-103	0	2046	Centimeters
Spare	2	104-105			Reserved
Maximum Length/Security	12	106-117			Reserved for Maximum Length or Security
Data Format Code	6	118-123			
Second Check Sum	2	124-125			
Frame Marker	2	126-127			

The fields are arranged in a hierarchical fashion in order to expedite translation and processing by the data processor. It is intended that the data processor will first look at the Data Format Code to determine if the Tag should be decoded or ignored. For example, in some cases the data processor will wish to ignore all Tags except those specified as highway (ATA Standard) or marine intermodal (ISO Standard) Tags.

Once the Data Format Code has been processed, then the data processor will look to the Tag Type to determine the configuration, capabilities, and memory capacity of the Tag. (Note: This field is provided for future use to accommodate new types of Tags which may have different memory or communication capabilities).

Next, the data processor will examine the Equipment Group Code to determine if the tagged equipment is relevant. For example, the processor may ignore, or process differently, non-revenue equipment than it would trailers or dollies.

The order in which the remaining fields are processed will be dictated by the particular application.

1.1 **Equipment Group Code:** This is a numeric field having a value from 0 to 31 that indicates the general type of equipment. A proposed table of values for this field is indicated below. Note that only major categories of equipment types are indicated in this field and other fields are allotted to indicate further details. The Equipment Group Code for a chassis is decimal 27 (binary 11011).

Table B: Data Values for the Equipment Group Code

<u>Value</u>	<u>Description</u>	<u>Value</u>	<u>Description</u>
0	Other	16	Reserved
1	Reserved	17	Tractor (Power Only)
2	Reserved	18	Truck (Power and Cargo Bed)
3	Reserved	19	Railcar
4	Reserved	20	Dolly
5	Locomotive	21	Trailer
6	End-of-Train Device	22	Reserved
7	Reserved	23	Reserved
8	Reserved	24	Reserved
9	Reserved	25	Reserved
10	Intermodal Container	26	Reserved
11	Reserved	27	Chassis
12	Reserved	28	Reserved
13	Reserved	29	Reserved
14	Non-Revenue	30	Reserved
15	Reserved	31	Reserved

1.2 **Tag Type:** The Tag Type indicates the configuration, capability, and memory size of the Tag. At the present time there is only one Tag Type defined, as indicated in Table C.